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WHAT IS CLAIMED IS

>1. A method for fabricating a semiconductor device, comprising the steps of:

forming a barrier conductor layer on a substrate;

exposing said barrier conductor layer to a 10 first reducing gas atmosphere at an elevated substrate temperature;

forming, after \said step of exposing said barrier conductor layer to said first reducing gas atmosphere, a metal film on said barrier conductor layer by a CVD process; and

exposing said metal film to a second reducing gas atmosphere at an elevated substrate temperature.

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2. A method as claimed in claim 1, wherein said first reducing gas atmosphere is selected from 25 any of the group consisting of silane, ammonia and hydrogen.

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3. A method as claimed in claim 1, wherein said step of exposing said barrier conductor layer to



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said first reducing gas atmosphere is conducted at a temperature of 250 - 500 °C.

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4. A method as claimed in claim 1, wherein said second reducing gas atmosphere is selected from any or more of hydrogen and nitrogen.

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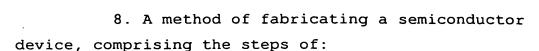
5. A method as claimed in claim 1, wherein said step of exposing said metal film to said second reducing gas atmosphere is conducted at a temperature of 250 - 500°C.

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6. A method as claimed in claim 1, wherein said metal film is a Cu film.

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7. A method as claimed in claim 1, wherein said barrier conductor layer is formed of any of Ta or TaN.



forming a barrier conductor layer of any of tungsten nitride or tantalum nitride on a substrate;

exposing said barrier conductor layer to a plasma of a reducing gas at an elevated temperature; and

forming, after said step of exposing said barrier conductor layer to said plasma, a metal film on said barrier conductor layer by a CVD process.

9. A method as claimed in claim 8, wherein said reducing gas is hydrogen.

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10. A method as claimed in claim 8, wherein said step of exposing said barrier conductor layer to said plasma is conducted at a temperature of 50 - 400°C.

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11. A method as claimed in claim 8, further comprising, after said step of forming said metal film, a thermal annealing process applied to said metal film in a reducing gas atmosphere.



12. A method as claimed in claim 11, wherein said thermal annealing process is conducted at a temperature of 250 - 500°C.

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13. A method as claimed in claim 8, wherein said metal film is formed of Cu.

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14. A method of fabricating a semiconductor
15 device, comprising the steps of:

alternately and repeatedly forming, on a substrate, an insulating film, a barrier conductor layer of any of tungsten nitride and tantalum nitride, and a metal film, said metal film being formed by a CVD process,

wherein a step of exposing said barrier conductor film to a plasma of a reducing gas at an elevated temperature is interposed between said step of forming said barrier conductor layer and said step of forming said metal film.

